UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Skyrmion Spin Caloritronics (Computational), Faculty of Engineering and Physical Sciences

Salary: Grade 7 (£39,105 – £46,485 p.a.) Due to funding restrictions, an appointment will not be made higher than £40,247 p.a.

Reference: EPSPA1125

Location: Leeds main campus

Closing date: Sunday 09 March 2025

Fixed-term until 30 September 2028

We are open to discussing flexible working arrangements

Research Fellow in Skyrmion Spin Caloritronics (Computational), School of Physics and Astronomy.

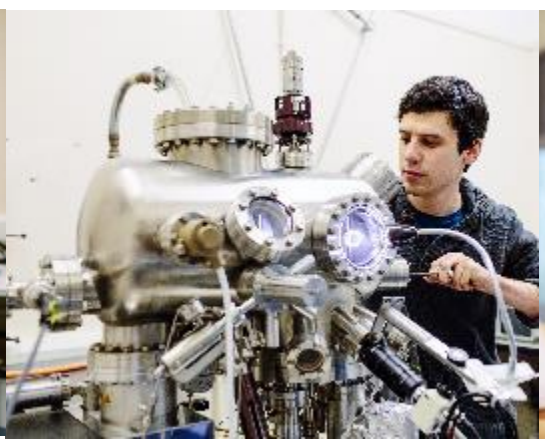
Are you a researcher with expertise in skyrmions or spin caloritronics, ready to take the next step in your career? Whether you are building on early research experience or bringing established expertise, this is an exciting opportunity to contribute to one of the UK's leading spintronics research groups.

We invite you to join a collaborative experimental and computational project on 'Thermodynamic Scaling in Nanomagnetism and Thermally Driven Skyrmion Motion,' funded by the Engineering and Physical Sciences Research Council. This project is led by Prof. Christopher Marrows at the University of Leeds, working closely with Dr Joseph Barker, Dr Thomas Moore, Dr Simon Connell, and project partners at NIST (Boulder, USA) and QinetiQ (UK).

Holding a PhD (or have submitted your thesis before taking up the role) in condensed matter physics, materials science or a closely allied discipline, you will have research experience in Physics and/or Materials Science along with significant experience in the physics of nanomagnetism and/or spintronics, ideally in the field of skyrmion or related areas.

This post focuses on computational and theoretical research, where you will develop novel methods and models to calculate the temperature dependence of magnetic parameters in thin films, including systems with imperfections such as interface roughness or non-crystalline structures. Using a multiscale approach, you will apply these parameters to simulate skyrmion motion within temperature gradients and compare your findings with experimental results. A second post, that will be advertised separately, will cover experimental aspects of the project.

In addition to conducting a series of research projects, both roles require excellent communication skills. You will be responsible for interactions with collaborators, preparing publications, and delivering presentations. You will also have opportunities to travel, visiting project partners and attending conferences in the UK and internationally to present your findings.

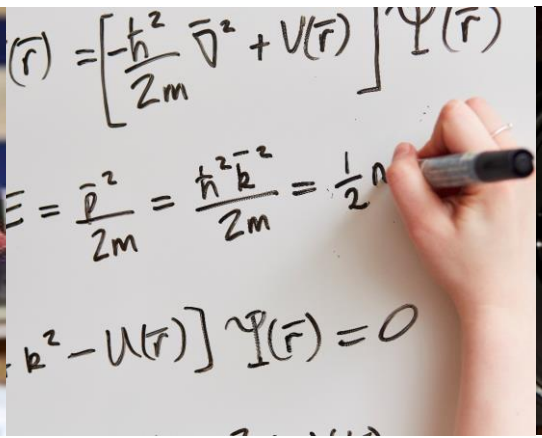




What does the role entail?

As a Research Fellow, your main duties will include:

- Designing, planning, and executing computational and theory work to achieve the project objectives, in close consultation with the academic leads;
    - Developing and comparing computational methods to calculate micromagnetic properties from spin models, constructing and simulating realistic atomic-scale models of relevant thin film materials, and interpreting simulation results within theoretical frameworks of thermal magnetic behaviour;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own research;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals and by presentation at national and international meetings;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.



What will you bring to the role?

As a Research Fellow, you will have:

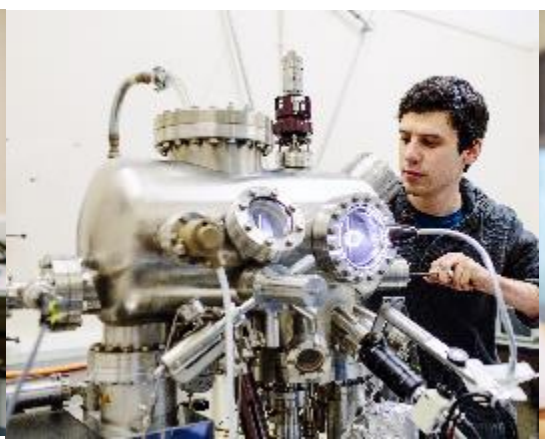
- A PhD (or have submitted your thesis before taking up the role) in theoretical or computational condensed matter physics or materials science or a closely allied discipline;
- A strong background in computational/theoretical study of magnetic materials;
- The ability to travel to meetings with project partners and conferences as required by the project schedule, including international travel;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- A developing track record of peer-reviewed publications in international journals;
- Excellent communication skills both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both independently and in a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of pursuing external funding to support research;
- Knowledge of the scientific concepts underlying the project, in this case, those relevant to the variation of magnetic properties with temperature and magnetic skyrmions;
- A strong foundation in magnetism theory, statistical mechanics, and condensed matter physics;
- Strong programming abilities (C++ is preferable) and experience working on HPC Linux systems;
- Experience modelling magnetic materials at the atomic scale.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.


Contact information

To explore the post further or for any queries you may have, please contact:

Dr Joseph Barker, Associate Professor & Royal Society University Research Fellow
Email: J.Barker@leeds.ac.uk

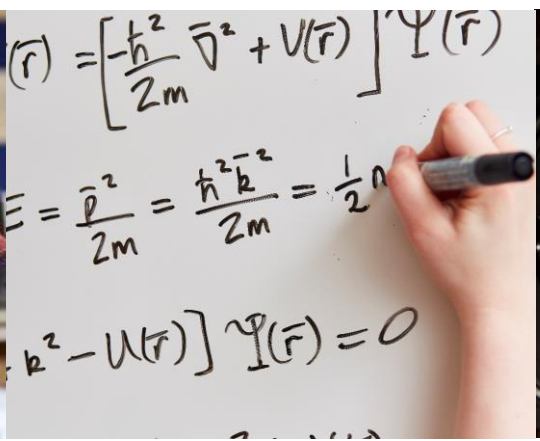
Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Physics and Astronomy.

Working at Leeds
We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

A diverse workforce
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.


Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our How to Apply information page or by getting in touch by emailing HR via hr@leeds.ac.uk.

Criminal Record Information
Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.

Salary Requirements of the Skilled Worker Visa Route
Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit the Government's Skilled Worker visa page.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit the Government's page, Apply for the Global Talent visa.